DOCUMENT RESUME

ED 160 068 **IR 006 208**

AUTHOR	Hicks, Bruce; Zibit, Melanie
TITLE	MC Painting--A New Medium for Art Education.
INSTITUTION	Illinois Univ., Urbana. Dept. of Secondary Education.
REPORT NO	No. 16
PUB DATE	Mar 78
NOTE	11p.; The Illinois Series on Educational Application of Computers
EDRS PRICE	MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS	*Art Education; *Computer Programs; Computer Science; *Display Systems; *Painting
IDENTIFIERS	*Microcomputers

ABSTRACT

The MC (microcomputer) paint brush and other parts of the MC painting medium can be used easily by the student, teacher, or artist, young or old, to produce color pictures on a TV screen and store them for later viewing or modification. The 15 colors available--two intensities of each of six colors, black, and two whites--can be painted with any one of four "brushes"--one narrow and three wide--making continuous strokes or one dot at a time. The essential element of decision-making that is inherent in the artistic creative process is present in each step of MC painting; this element is easily controlled by the artist-user, who can be as spontaneous or as calculating, as fast or as slow, in his artistic activity as he wishes. (CMV)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED160068

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Number 16

The Illinois Series

on

Educational Application of Computers

MC PAINTING - A NEW MEDIUM FOR ART EDUCATION

Bruce Hicks and Melanie Zibit

March 1978

Department of Secondary Education
College of Education
University of Illinois
Urbana, Illinois

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Bruce Hicks

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

© Bruce Hicks (1978)

IR006208

ISEAC Number 16

MC Painting - A New Medium for Art Education

Bruce Hicks and Melanie Zibit

SUMMARY

The MC (microcomputer) paint brush and other parts of the MC painting medium can be used easily by "anyone"--student, teacher, artist, young or old--to produce 15-color pictures on a TV screen and store them for later viewing or modification.

Introduction

Three rules have influenced our development of art education facilities based on microcomputers.

a) Provide maximum educational benefits from the minimum amount of software and hardware.

b) Supply means for direct and simple means of interaction[1] of the student or teacher with his art work, analogous to painting with a brush.

c) And, in the words of a sculptress, "find what is in the stone", that is, discover and develop the medium's artistic capabilities so that we and others can find the art hidden within it.

The rules were applied in a computer program MART4 written last year which made it possible for the user to "draw" black and white pictures on a TV screen. The pictures consisted of lines of characters (the characters available on the computer keyboard) of any length and shape. Drawing of the lines was controlled by "arrow keys" specifying the direction in which a line was being drawn. The first rule had also been applied earlier in a program that made the computer keyboard act like a piano keyboard in playing and storing a melody.[2]

The rules were also applied in developing the computer program EMBR2. Our intent was to provide for the student or teacher a new tool, the MC* paint brush, used in a new medium, which we call "MC painting." The starting point for the development of MC painting was the pioneering, imaginative program designed by Project SOLO.[3] The intention behind this program, and the computer system it controlled, was to provide interactive color graphics in the form of a "cybernetic crayon" for the artist-user with which, using a so-called digitizer, he could put small squares of color or black or white on a 64 by 64 grid on a color TV, much as though he were marking it with a crayon. Thus $64^2 = 4096$ squares altogether could be chosen by the artist, in his development of a picture on the TV screen in front of him.

We have improved the crayon, for our purposes and following our rules. The resulting MC paint brush is part of MC painting, the new medium. The MC paint brush does do a "lot with a little." Only small modifications of the (already short) program for the cybernetic crayon were needed, and a "joystick" was substituted for the more expensive "digitizer" used for the cybernetic crayon. The MC paint brush is somewhat easier to use than the cybernetic crayon. Each tool is useable by "anyone" in a fashion similar to using a brush, a pen, a spray or a crayon. Each is a potentially important tool in art and aesthetic education.

In the next section, a more detailed account of the MC paint brush and other parts of the new medium will permit visualization of the advantages and disadvantages of its use, as compared to more familiar media, in art and computer science teaching or training teachers in these areas.

---

*MC stands for microcomputer

The MC Painting Medium

a) 15 colors (two intensities of each of six colors plus black and two "whites") which can be painted with the brush;

** b) choice of any one of these colors as the ground color of the whole screen**;

** c) choice among one narrow and three wide** "brushes";

d) many options in the mode of use of the MC paint brush--

- control of its position by moving the joystick in any direction at any speed, holding it there while changing color or "cursor"* control (see below); or allowing it to return to the origin (center of the picture);

- choice of making a continuous brush stroke or of one dab (an isolated square of color) at a time;

** - indication by a blinking cursor* of where the brush is** (when this is desired) without changing the color that had been painted there. (The cursor reduces the problem of coordinating movements of the joystick (or the SOLO digitizer), with movement of the MC brush (or crayon) on the picture, a difficulty that enters because the artist-user moves a joystick situated a few feet away from the picture rather than holding a brush that is in direct contact with the picture.)

** e) storage** of a full screen (or picture) on a floppy disc (or on a a cassette tape), which is easy and fast, as is also its later recall for re-plotting on the screen, for purposes of viewing or modifying the picture.

---

* The cursor is a small, blinking spot on the TV screen which shows where the MC paint brush is in the picture. It moves as the joystick moves but does not change any spot in the picture.

** Indicates an extension beyond the cybernetic crayon.

The replotting of the picture without modification does not use the MC paint brush computer program so makes minimal use of the computer.

The capabilities of the computer system and its program produce a new medium that is clearly analogous to, but not the same as, painting or crayoning. Some of the differences are worth noting:

a) The MC paint brush user can choose the brush, the brush position and the color in any sequence, so that, for example, he can change brush or color without moving the brush, if he so desires. Additional programming, without adding equipment, can provide many extensions of this MC painting medium. (See the section "Remarks".)

b) MC painting is a medium that is unfamiliar (at present) to most prospective users, but is probably easier to learn how to use (and less 'messy') than conventional painting tools and media-easier partly because the MC paint brush does not permit control of some of the aesthetic elements, like texture and fine detail, for example.

c) Pictures produced on the color TV screen can, because of the coarse raster or grid, be seen clearly and simultaneously by many students or other viewers.

d) A microcomputer system that would provide MC painting would at present cost $1000-1500, in addition to the color TV set. But this same computer system would of course be a multi-purpose facility for instruction, record keeping, data-processing or other uses in the school or home.

MC Painting: An Example

The new medium can release and enable very directly the innate spontaneity and creativity of the user (student, teacher, elder. . .). Let us look at what

a new user might do, the sequence of steps he might take, in experimenting with MC painting and in making his own original painting.

1. Select the narrow brush and a color.

2. Move the brush (joystick and cursor) to a position selected on the picture, touch the brush to the picture (i.e., turn off the cursor) and paint a stroke of the length and shape he wishes (by moving the joystick), lift the brush from the picture (i.e., turn on the cursor).

3. Repeat 1) and 2) many times with different colors and brushes, including white or black or ground color to "erase" what has previously been painted.

4. When finished with work on this painting for this session, store the picture on disk, for later viewing or repeated modifying until satisfied with this personal, freely creative effort.

Other sequences and other uses of the tools are of course possible (including combinations of the tools discussed in the section "Remarks"). But it is clear that the essential element of decision-making that is inherent in the artistic creative process is present in each step and that this element is wholly under the (easy) control of the artist-user. He can thus be as spontaneous or as calculating, as fast or as slow in his artistic activity as he wishes.

The Computer Equipment and Programs[4]

a) Our microcomputer system MSEA[5] is based on an IMSAI 8080 microcomputer and iCOM dual floppy disk drives. It includes the Cromemco Dazzler interface used by the SOLO Project, the Cromemco joystick*, and a Pixie-verter interface to the TV.

---

* The Cromemco program DOODLE-DAZZLER is like the Project SOLO program but adds the ground color and uses the joystick in place of the digitizer.

b) A 190 statement assembler program EMBR2 (307 bytes of object code) provides, together with the computer system, the capabilities described in items a) to d) of an earlier section. A monitor program makes it easy to transfer a picture between the TV screen and the floppy disc (storage and recall of the picture). An assembler and editor assist the writing and execution of the program EMBR2.

Remarks

Many improvements and extensions of MC painting are realized by making additions to the program EMBR2. Some of them are:

a) horizontally or vertically striped ground colors, or alternatively, stripes laid over a picture;

b) simultaneously painting several dabs or parallel strokes of different color (as though painting with several conventional paint brushes simultaneously with one hand);

c) a "generalized palette";

d) copying a block (of nine adjacent squares, for example) from one part of the picture to another, with pre-selected, automatically executed changes (such as replacing each red square with a yellow one);

e) fast algorithms added to the program which generate or manipulate chosen characteristics of the picture*;

---

* Each picture is a member of a set of hundreds of pictures which the user could generate (reversibly), using the switiches or keyboard. There are many such sets of pictures. There are more than 10^{4000} different pictures, a number which, for practical purposes, is infinite.

f) dynamic or time-varying effects (already implemented, but often inartistically, in popular applications of the Dazzler;

g) a second or buffer 2000 bytes of computer memory to facilitate the last three items, or to make possible rapid interchange or two pictures, for purposes of comparison.

We are not hurrying to make such improvements because, at each stage of the further development of EMBR programs and of the MC painting medium, we wish to maintain a balance or compromise between ease of use of the brush and other tools and the many degrees of versatility of the tools. We can discover what is easy and natural (and productive, artistically and educationally) in the use of various extensions of MC painting by encouraging students and teachers and artists to experiment with them and discuss their work with us.

Also, while we admire "computer art" and learn much from its various manifestations, we are not seeking to produce a means for doing micro-computer art** (in which the computer would stand between the artist and the picture) but instead to provide increasingly intimate interaction between everyman-user (student, teacher, amateur, professional artist) and his art or art study (each in their own way) via the MC paint brush, and the cybernetic crayon and whatever new variations their progeny become. These means must be public, available and inexpensive as well as highly and easily interactive.

** There is, of course no sharp boundary between computer art and MC painting. They indeed overlap and complement one another.

It is these qualities that we feel the new microcomputer-based art medium must possess if it is to fulfill its promise in art education. We, like Robert Mallary[6], are inspired by what we know is possible.

1. See also Melanie Zibit and Bruce Hicks, "Aesthetic Education and Computers" (Article being prepared).
2. Bruce Hicks, "Dompier Plus: A Musical Keyboard." Dr. Dobb's Journal V. 2, No. 6, June/July 1977, p. 21. See also the reprint in the present ISEAC report.
3. Thomas A. Dwyer and Leon Sweer, "The Cybernetic Crayon," Solo Works Newsletter #37, Project SOLO (University of Pittsburgh), Fall 1976. A term crayon is as good as an analogy as a paint brush but yields fewer useful nouns and adjectives for describing this new application of the microcomputer.
4. See the reference in footnote 3 for a lucid description of the SOLO program and equipment and the valuable educational philosophy of the SOLO Project.
5. Bruce Hicks, "MSEA-The Microcomputer System for Educational Applications" ISEAC No. 20, February 1977.
6. Robert Mallary, "The Artist and the Computer" (Ed., Ruth Leavitt), Creative Computing Press. (Morristown, N.J.) 1976, pp. 4-8.

SE-962
2/28/78 JJ